The opinion in support of the decision being
entered today was <u>not</u> written for publication
and is <u>not</u> binding precedent of the Board.

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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<u>Ex parte</u> MASATO NAKAJIMA,
JUNICHI YAMAGUCHI, HIROYA AKITA,
YOSHIHIRO TSUJI, KAZUYUKI SASAKI,
and NAOTO ISHIKAWA

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Appeal No. 1998-0728
Application 08/468,231[1]

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ON BRIEF

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Before HAIRSTON, BARRETT, and RUGGIERO, <u>Administrative Patent
Judges</u>.

BARRETT, <u>Administrative Patent Judge</u>.

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[1] Application for patent filed June 6, 1995, entitled "A
Vehicle Surrounding Monitor With Obstacle Avoidance Lighting,"
which is a continuation of Applications 08/217,131, filed
March 24, 1994, now abandoned, which is a continuation of
Application 07/945,482, filed September 15, 1992, now
abandoned, which claims the foreign filing priority benefit
under 35 U.S.C. § 119 of Japanese Application 3-239551, filed
September 19, 1991, and Japanese Application 4-170559, filed
June 29, 1992.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the final rejection of claims 1, 3, and 5-10.

We reverse.

BACKGROUND

The disclosed invention is directed to a vehicle

surroundings monitor which detects the sizes and positions of

obstacles and ditches to provide the driver with sufficient

information for safe driving. Reference data representing the

location of the supporting surface when the vehicle is

unloaded is corrected for the change in vehicle height due to

addition of a load by a height correction means.

Claim 1, the sole independent claim, is reproduced below.[2]

1. A surroundings monitor for a vehicle moving over
a supporting surface comprising:

a two-dimensional dot matrix pattern light projector
which receives a laser beam and projects a
two-dimensional light spot matrix pattern downward onto a
monitored area within said supporting surface located in
close proximity to said vehicle;

a camera for photographing the light spot matrix
pattern; and

a data processor which processes image signals
supplied from the camera to detect the presence of
obstacles and depressions in the monitored area within
said supporting surface, wherein said data processor
further comprises:

a reference data generating means which extracts a
light spot pattern from pixel data and generates

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[2] "Baricenter" in claim 1 and in the specification
should probably be spelled "barycenter."

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reference data including a coordinate position of the
light spot baricenter, the pixel data being obtained from
the image signals supplied by the camera that
photographed the light spot pattern projected upon a flat
supporting surface when sensing means is first mounted on
a vehicle without any load on board the vehicle;

a detecting means which compares the light spots of
the reference data with light spots which are extracted
from pixel data, the pixel data being produced from the
image signals supplied by the camera that photographed
the light spot pattern projected upon a supporting
surface being examined, in order to detect the presence
of obstacles and depressions; and

a height correction means which corrects the
coordinates of the light spots of the reference data
according to changes in the camera height from the
supporting surface, wherein said height correction means
first detects displacements of the coordinates of light
spots at several predetermined points from those at the
same points of said reference data with a load on board
the vehicle, determines a height correction value by an
amount of displacement for every light spot caused by a
weight of the load, said amount being calculated by
interpolation from said detected displacements, and
corrects the coordinates of said reference data by said
height correction value for obtaining the actual
reference data to be used in said detecting means.

The Examiner relies on the following prior art:

Caimi   4,948,258   August 14, 1990
Evans, Jr. et al. (Evans)   4,954,962   September 4, 1990
Kurami et al. (Kurami)   5,081,585   January 14, 1992
                                          (filed June 15, 1988)
Aoyama et al. (Aoyama)   5,148,322   September 15, 1992
                                          (filed November 9, 1989)

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Claims 1, 3, 9, and 10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Evans and Caimi.

Claims 5 and 6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Evans and Caimi, as applied in the rejection of claims 1 and 3, further in view of Kurami.

Claims 7 and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Evans and Caimi, as applied in the rejection of claim 1, further in view of Aoyama.[3]

We refer to the Final Rejection (Paper No. 32) (pages referred to as "FR__") and the Examiner's Answer (Paper No. 38) (referred to as "EA__") for a statement of the Examiner's position, and to the Brief (Paper No. 37) (pages referred to as "Br__") for a statement of Appellants' arguments thereagainst.

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[3] The Examiner rejects claims 7 and 8 under 35 U.S.C. § 103(a) as being unpatentable over Evans, Caimi, and Kurami, as applied in the rejection of claims 1, 3, 5, and 6, further in view of Aoyama. However, claims 7 and 8 depend on claim 1. Thus, the statement of the rejection should only refer to the rejection of claim 1 and should not include Kurami.

OPINION

The issue is whether the combination of Evans and Caimi discloses or suggests the claimed "height correction means." The claims will stand or fall together with claim 1.

While the Examiner's statement of the rejection (FR3-4; EA5) indicates that Evans has a height correction means, the Examiner admits in response to the arguments that Evans does not disclose the height correction means of claim 1, but reasons as follows (FR7-8; EA9-10):

> The examiner agrees with the applicant that Evans Jr. does not disclose the height correction means as recited in the claim. However, Evans Jr. clearly discloses height measuring means (column 9, line 5 [to] column 10, line 68) to measure the height of the obstacle in front of a robot. Evans jr. [sic], further discloses the means for measuring the depression or hole in the floor surface ahead of the robot by using the height measuring algorithm as "Thus, range, bearing and elevation can be measured from the pixel position" (column 12, lines 19-22). Since the height calculating algorithm using slope and coordinates of various points on elevation are well known, determining a correct height of a vehicle with respect to road surface is very obvious and does not represent any patentably distinct concept in light of the cited references.

Appellants note that claim 1 recites generating reference data from a "light spot pattern projected upon a flat supporting surface when sensing means is first mounted on a vehicle without any load on board the vehicle," which initial

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reference data is very time consuming to obtain in the first

place. Appellants argue that the functions performed by the

height correction means allow the reference data to remain

<u>unaltered</u>, producing the advantage over the references that

the processing time is less than that required for constantly

changing all the reference data (because only several

predetermined points are needed) and the advantage that it can

also be adapted for the situation where the vehicle is

inclined due to a heavy mass loaded at one end (Br12).

The Examiner essentially concludes that it would have

been obvious to provide height correction means in Evans to

determine the height of the vehicle because Evans can

determine the height of an object in front of the vehicle. It

is true that Evans can determine (to a limited degree) the

height of an object or depression in front of the vehicle

using the oblique structured light plane 32a in figures 4 and

5, where an obstruction shows up as a stripe 32d above, and a

depression shows up as a stripe 32c below, a stripe 32b

indicating the normal height of the floor, as shown in

figure 8 (col. 12, lines 23-42). There is no suggestion in

Evans about correcting the reference value (the location of

stripe 32b) to compensate for a change in height of the
vehicle due to loading. It does not appear that the robot
shown in Evans has the problem of loading. "The mere fact
that the prior art may be modified in the manner suggested by
the Examiner does not make the modification obvious unless the
prior art suggested the desirability of the modification."
In re Fritch, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1783-84
(Fed. Cir. 1992), citing In re Gordon, 733 F.2d 900, 902,
221 USPQ 1125, 1127 (Fed. Cir. 1984). No evidence has been
cited to support the Examiner's reasoning. It appears to us
that the Examiner has impermissibly used Appellants'
disclosure to provide the motivation for the modification.
Even if Evans did suggest correcting for the height change due
to load, there is no suggestion that it should be accomplished
in the way recited in claim 1; e.g., the reference data could
be completely remeasured instead of detecting displacements at
several predetermined points and using this height correction
data to obtain the reference data, as claimed. The references
to Caimi, Kurami, and Aoyama do not cure the deficiency of
Evans. Accordingly, we conclude that the Examiner has failed

to establish a <u>prima facie</u> case of obviousness. The

rejections of claims 1, 3, and 5-10 are reversed.

<u>REVERSED</u>

KENNETH W. HAIRSTON   )
Administrative   Patent Judge   )
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) BOARD OF PATENT
LEE E. BARRETT   )   APPEALS
Administrative Patent Judge   )   AND
)   INTERFERENCES
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JOSEPH F. RUGGIERO   )
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